REMARKS

Status of the Claims

- Claims 1, 9-13, 20-22, and 25-29 are pending in the Application after entry of this amendment.
- Claims 1, 9-13, 20-22, and 25-29 are rejected by Examiner.
- Claims 1, 13, 22, and 28 are amended by Applicant.

Interview Summary

Applicant thanks the Examiner for initiating a telephone interview on September 6, 2006. During that interview, Applicant explained how the how the prior art is overcome by the arguments presented in the June 30, 2006 response. The Examiner graciously indicated that he would re-read the specification.

Non-Final Rejection

Applicant notes that the Office Action summary page of the present action dated 11/22/06 has both boxes checked for a Final Action and for a Non-Final Action. However, Applicant notes that this action is responsive to an RCE filed September 5, 2006 and that new art is cited. Thus, Applicant concludes that the present action is Non-Final.

Claim Rejections Pursuant to 35 U.S.C. §103

Claims 1, 9-13, 21-22, 25-28 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,016,151 to Lin in view of U.S. Patent No. 5,224,210 to Pinedo et al. Applicant respectfully traverses the rejection.

Lin teaches a "3D triangle rendering by texture hardware and color software using simultaneous triangle-walking and interpolation for parallel operation" (Title). Lin also teaches that that parallel operation of both the host processor and a graphics-accelerator are used to render a graphic. Lin at col. 6 lines 11-16 teaches:

"The inventor has realized that performance of 3D rendering can be improved if both the host processor and the graphics-accelerator hardware can operate on the same

pixel at the same time. This parallel operation on a 3D pixel can lead to less expensive graphics-accelerator hardware for a desired 3D performance." (col. 6 lines 1-16).

Lin gives examples of how the host processor and the graphics accelerator work simultaneously to render graphics. Lin teaches:

"FIG. 3 is a diagram of a personal computer (PC) with a 3D graphics-accelerator that operates in parallel on the same pixel with the host processor. Color and depth interpolation is performed for a pixel by the host processor while texture interpolation for the same pixel is performed by the graphics-accelerator hardware." (col. 6 lines 17-23).

"The slopes or gradients of the color components R,G, B, and texture and other effects components are first calculated by CPU 80 based on their values for the three vertices of the triangle. Rather than immediately calculate the x,y coordinates of each actual pixel within the triangle, CPU 80 sends the texture-component gradients to texture renderer 51 in graphics accelerator 40. One of the three vertices is also sent as a starting vertex for the triangle-walking.) (col. 6 lines 51-58).

Thus, Applicant concludes that Lin teaches a method whose principles are based in the shared or joint computation of the host processor and the graphics accelerator. As a result, Lin teaches away from the invention of amended Claim 1 which recites, in relevant part:

"A method for rendering graphics on a display device for a computer system having a central processing unit, system random access memory, and a graphics card, said graphics card comprising a graphical processing unit, video random access memory, and a frame buffer, said method comprising:

rendering a complex graphic in the system random access memory with the central processing unit...; and

copying said complex graphic from the system random access memory directly into the frame buffer by the central processing unit, wherein copying directly

into the frame buffer *completely bypasses the graphical processing unit to render the complex graphic.* " (Claim 1)

Since amended Claim 1 recites rendering a complex graphic by copying the complex graphic into RAM and *completely bypassing* the GPU in order to render the complex graphic, and Lin specifically teaches splitting the work of rendering a graphic between a graphics accelerator and a host processor, then Lin teaches away from amended Claim 1. Applicant also amends independent Claims 13, 22, and 28 to recite a similar principle. Applicant finds support for this amendment in paragraph 0035 of the as-filed specification.

Thus, whereas Lin depends on the principle of sharing the work of rendering a graphic between both at CPU and a graphics processor, amended Claims 1, 13, 22, and 28 recite completely bypassing a GPU. Applicant respectfully submits that the principle of operation of Lin teaches away from the pending claims.

The Office Action dated 11/22/2006, page 3 states:
"Thus, Lin teaches all of the limitations of claim 1, except that copying directly into the frame buffer bypasses the graphical processing unit." However, Pinedo et al. teaches this feature." (Office Action, page 3)

Applicant agrees that Lin does not teach that copying directly into the from buffer bypasses the graphical processing unit. As argued above, the principle of operation of Lin is that graphics processing is shared between the CPU and the graphics accelerator.

Pinedo teaches, in Figure 1, an architecture that includes a host processor 20, a host interface 30, and a connection 90 from the host interface 30 to the frame buffer 70. Pinedo teaches:
"A pipeline bypass bus 90 is interfaced 30 to host processor 20 and frame buffer 70. Pipeline bypass bus 90 provides a separate path for data from host processor 20 to frame buffer 70. Thus, when data passes through pipeline bypass bus 90 to frame buffer 70, no overhead time through the graphics pipeline is incurred. Pipeline bypass

bus 90 offers fast block transfer operations and direct frame buffer access for data output from host processor 20. (col. 8 lines 19-27).

Although a bypass bus is present in Pinedo, Applicant is not fully convinced that the bypass bus is used to copy a complex graphic from the system random access memory directly into the frame buffer by the CPU in order to completely bypasses the GPU to render the complex graphic. However, if Penido does teach a bypassing a GPU to render a graphic by bypassing the GPU and copying the complex graphic into the frame buffer, then Pinedo cannot be combined with Lin because the addition of the restriction of completely bypassing the GPU to render a graphic changes the principle of operation of Lin.

As discussed above the principle of operation of Lin involves sharing the work of rendering a graphic between the CPU and the graphics accelerator whereas the Pinedo allows bypassing the GPU to render a graphic. The addition of Pinedo to Lin impermissibly changes the principle of operation of Lin. Also, as discussed previously, the basic principle of Lin teaches away from the claimed invention.

MPEP §2143.01 Part V states:

"THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious."

(MPEP §2143.01 Part V)

Applicant respectfully notes that Lin already teaches away from the claimed invention. Also, Applicant notes that the addition of the teaching of Pinedo to the teaching of Lin changes the principle of operation of Lin by forcing Lin to operate where the Lin graphics accelerator would be bypassed. In the combination of Lin and Pinedo, the primary teaching of Lin (i.e. the sharing of work between a CPU and the graphics accelerator) would be ignored. Since the combination of Lin and Pinedo changes the principle of operation of Lin, and since Lin actually teaches away from the claimed invention, then, according to

MPEP §2143.01 Part V, the combined teachings of Lin and Pinedo are not sufficient to render the claims prima facie obvious.

Applicant thus respectfully requests withdraw of the 35 USC §103 (a) rejection of the amended independent Claims 1, 13, 22, and 28 and their respective dependent claims because they patentably define over the cited art.

Claims 20 and 29 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,016,151 to Lin in view of U.S. Patent No. 5,224,210 to Pinedo et al. and in further view of US Pat No. 5,670,984 to Robertson et al. Applicant respectfully traverses the rejection.

Since Claims 20 and 29 are dependent upon amended independent Claims 13 and 28 respectively, and since independent Claims 13 and 28 patentably define over the cited art as stated above, then Claims 20 and 29 also patentably define over the cited art. Applicant thus respectfully requests withdraw of the 35 USC §103 (a) rejection of Claims 20 and 29.

Conclusion

In view of the above amendments and remarks, Applicant submits that the present application is in a condition for allowance upon entry of the amendments herein. Applicant respectfully and earnestly solicits a Notice of Allowance for all pending claims.

Respectfully submitted,

Date: January 10, 2007

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